sense, but net annual products. Nor is the reader's understanding helped by careful consistence in the use of the term. On p. 116 we read: "This normal price consists in the number of articles produced per person (labour unit) multiplied by the money price," which suggests a gross and not a net product; but on p. 142, "when we take the normal prices which are based upon the unit of labour, we find that this price, *which is the price the producer gets*. . . ."—our italics. On p. 205 we find a clear statement that it is really the net product which is wanted, but on p. 303 we read "normal price is the market price or price per unit, multiplied by the quantity produced." The authors have only themselves to thank if few readers have the patience to stand much loose writing of this sort.

Frankly, this is a pity. For to the present reviewer there seems something to be said for the constructive argument of the book, though very little for much of the criticism contained in it. The argument might have received more attention if concisely presented, with unnecessary criticism eliminated.

G. U. Y.

Our Bookshelf.

The War List of the University of Cambridge, 1914–18. Pp. xiv + 616. (Cambridge: At the University Press, 1921.) 20*s*. net.

In his address to the Senate of the University of Cambridge, delivered on October 1, 1915, the retiring vice-chancellor, Dr. M. R. James, spoke of the services which members of the university were giving in their country's need. He said: "We are debtors to all. . . . Yet the university bears them upon her heart and will not, I know, neglect to perpetuate the memory of them." No public memorial has, indeed, been raised to their memory, but a noble record has been given to the world by the publication of this volume, which will carry far and wide the names of those members of the university who served with his Majesty's forces.

The volume has been prepared under the able editorship of Major G. V. Carey, of Clare College, and it is based on the lists published from time to time by the *Cambridge Review*, the materials for which came from the various college records. The syndics of the University Press took over the records in December, 1919, and since that date every name has been checked by the official Service Lists. Faced with the task of deciding which names were to be included, it was determined that residence prior to war service should be the criterion, with the exception of those who were prevented from going into residence in October, 1914, by reason of their having joined the forces; further, only those names which appeared in the various Service Lists have been included. This necessarily excludes the names of many who performed valuable and distinguished national service in other capacities, but it is obvious that to obtain an accurate record doing justice to all is almost an impossibility.

The volume concludes with an alphabetical index to the names, and a comprehensive summary—in itself a task of considerable magnitude—giving, for each college and for the whole university, the number of men who served, the number killed in action, the number of honours, etc. The first total is 13,878, and the second 2162—figures which show what a great part the university played in the war, and she has commemorated them worthily in this handsome list.

Meteorological Office—Air Ministry: British Rainfall, 1920: The Sixtieth Annual Volume of the British Rainfall Organization. Pp. xxviii + 285. (London: H.M.S.O., 1921.) 12*s*. 6*d*. net.

Rainfall statistics over the British Isles have in no way suffered by the transfer of the collection and discussion of the observations from private to public control. The present annual volume is the sixtieth issued, and the second published under the management of the Meteorological Office. The war occasioned some diminution in the number of observers, but a considerable recovery from this is shown, the number now being 4952, an increase of 54 on 1919. A column is added to the detailed observations, giving the number of wet days or days with 0·04 in. or more of rain, and for the present the rain days or days with 0·01 in. of rain are also given.

Standard average values for the period 1881–1915 are used for the first time in "British Rainfall," and these are in agreement with the averages in use by the Meteorological Office in its various publications. Monthly average maps are given for the new period now introduced.

The distribution of total rainfall for 1920 is shown by a map as a frontispiece. Maps of monthly and seasonal rainfall are given, and the peculiarities are well described in the letterpress. Droughts and excessive rains are discussed, and there is much valuable information on evaporation and percolation in 1920.

Special articles are given on the new averages by the Superintendent of the Rainfall Organization, and also on the presence and distribution of salt in the air over the British Isles, by Mr. Wilfred Irwen, and on the Nipher rain-gauge shield, possibly of use where over-exposure is experienced.

Rainfall for 1920 was generally in excess of the average except in the eastern districts of Great Britain. The results for the droughty year 1921 will be of great interest.

C. H.

Geography: Physical, Economic, Regional. By J. F. Chamberlain. (Lippincott's School Text Series.) Pp. xviii + 509. (London: J. B. Lippincott Co., 1921.) 15*s*. net.

Essentially this book is an account of the earth, its surroundings, and its products in relation to man, but, since it is addressed particularly to

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citizens of the United States, nearly all its illustrations, verbal and pictorial, are taken from North America and the possessions of the United States, and all the references, with few exceptions, are to American writers. In view of the fact, admitted by the author, that "the future history of America is to be inseparably connected with that of the rest of the world." more attention might have been directed to other countries; for instance, some of the street-scenes in American cities might have yielded to views in European or Asiatic capitals. It is, however, right that geographical study should begin with the home region, and this idea frequently finds expression in the inquiries suggested at the end of each chapter—*e.g.* "Make a careful study of the influence of geographic environment in your own State or locality. What factors are the most important? Are there any national forests in your State? Locate them. Is the Federal Government aiding in road construction in your vicinity?" But other suggestions will broaden the reader's outlook—*e.g.* "How will the economic geography of France be changed by the restoration of Alsace-Lorraine? What made possible the shipping of meat and dairy products from Australia and New Zealand to the British Isles?" These questions cannot be answered from the book itself. He who succeeds in answering them all will have had to read and think much, and will have become a more valuable citizen.

Modern High-speed Influence Machines. By V. E. Johnson. Pp. viii + 278. (London: E. and F. N. Spon, Ltd., 1921.) 14*s.* net.

THE author points out that electrostatic machines are used much more on the Continent and in America than in this country, where they do not appear to be held in good esteem. He proceeds to argue that this bad repute is undeserved, and proceeds to investigate the capabilities of this class of machine and the conditions upon which its efficiency and trustworthiness depend. Practically all the types which have been proposed from time to time are described and analysed, and accounts are given of the author's own experiments, resulting in a type considerably more efficient than the well-known Wimshurst machine. He claims that, as a source of high potential supply, a high-speed influence machine designed on the right lines should be as efficient as an induction coil with all its accessories, and that, principally on account of the continuity of its supply and the higher voltage available, it should give better results for Röntgen-ray work, particularly with tubes for high penetration. Other fields in which he suggests that such machines may prove useful include applications to wireless telegraphy, electro-culture, electro-therapeutics, ignition, and the testing of materials.

Although we find here and there a little looseness of expression and vagueness in quantitative statement, there is evidence of clear thinking in the construction of a consistent theory of the action of these machines from the mass of incomplete explanation which is diffused among the existing literature on the subject. There is also some thoroughly practical information as to the construction of these machines.

The Transition Spiral and its Introduction to Railway Curves. By A. L. Higgins. Pp. viii + 111. (London: Constable and Co., Ltd., 1921.) 6*s.* net.

THE early part of this book is devoted to a discussion on the principles underlying transition curves. The objects of a transition curve on a railway are to provide a gradual increase in curvature from zero at the point of contact of the curve and the straight part of the line of rails to a curvature equal to that of the central circular portion of the curve, and also to provide for a corresponding increase in the superelevation. Special attention is given to the clothoid (or Glover's spiral) $\lambda = m\sqrt{\phi}$, and the mathematical work required to elucidate this curve is carefully and clearly explained. The conditions which govern the lengths of transition curves are adequately discussed. The engineer may be called upon to insert transition curves in existing lines of railway and also in new lines, and for either purpose he will find the explanations of the procedure given in this book of great service. The latter half of the book is entirely taken up with field exercises fully worked out, which include not only the ordinary problems, but also problems in compound curves and reverse curves. This part is especially valuable, and cannot fail to be of use to railway engineers. We can recommend this book with confidence both to students of surveying and to railway engineers.

The New Hazell Annual and Almanack for the Year 1922. By Dr. T. A. Ingram. Thirty-seventh year of issue. Pp. xlvi + 585. (London: Henry Frowde, Hodder and Stoughton, Ltd., 1922.) 5*s.* net.

THE new volume of Hazell's Annual will receive a cordial welcome from all who have occasion to make use of reference books. It is smaller by about two hundred and thirty pages than the volume issued last year, the sections dealing specifically with the Overseas Dominions and with foreign countries having been omitted, but the omission has enabled the publishers to make a handsome reduction in the price. We also miss several of the interesting surveys of the progress in particular subjects during the previous year which have hitherto been included. Other features of past volumes, such as the calendars, astronomical and meteorological data for the current year, and a compilation of the particulars of societies and institutions, which includes most of the better-known British and foreign learned societies, have been retained. A large amount of educational information which covers the universities, colleges, and secondary schools in the British Isles has also been gathered together. The volume is a valuable book of reference on matters of general interest.

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